Shorebird Migration Staging on the "Kutawagan Lake wetland complex" in the Mount Hope-Prairie Rose (PFRA) Community Pasture, Saskatchewan.

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Summary

The Kutawagan Lake wetland complex in east central Saskatchewan was surveyed in the spring of 2001 and 2002 to determine the extent migrating shorebirds use the area. The entire complex was surveyed with the use of All Terrain Vehicles to access wetland shorelines. Where possible, the complete perimeter of the waterbody was surveyed. Surveys were conducted every four days from 11 - 22 May, 2001 and 15 - 28 May, 2002. A large variety of shorebird species (27 in total including 18 northern migrant species) were observed during the surveys. Red-necked Phalaropes (*Phalaropus lobatus*) were the most abundant shorebird present (peak of 21,144 and 10,077 birds in 2001 and 2002, respectively). Stilt (*Calidris himantopus*), Semipalmated (*C. pusilla*), Baird's (*C. bairdii*), and Least Sandpipers (*C. minutilla*) were also abundant in the complex. Over 35,000 and 25,000 shorebirds were observed in May 2001 and 2002, respectively, indicating that the Kutawagan Lake wetland complex is important to shorebirds during spring migration. Drought conditions caused wetland deterioration in the region and influenced shorebird numbers in 2002. However, the high numbers of birds using the complex qualify the area as a Regional level shorebird site under the Western Hemisphere Shorebird Reserve Network. The variety of wetland types and sizes, and subsequent availability of suitable shorebird habitat, primarily under "normal conditions" makes this wetland complex an important migration area for shorebirds.

Résumé

Aux printemps de 2001 et de 2002, dans le complexe de milieux humides du lac Kutawagan (centre-est de la Saskatchewan), on a effectué des relevés pour quantifier l'utilisation de cette zone par les oiseaux de rivage migrateurs. On a couvert l'ensemble du complexe, les véhicules tous terrains utilisés ayant permis d'accéder aux rives. Quand cela était possible, le périmètre entier de la masse d'eau a été parcouru. Les relevés ont été réalisés tous les quatre jours du 11 au 22 mai 2001 et du 15 au 28 mai 2002. Une grande variété d'espèces d'oiseaux de rivage (27 espèces au total, dont 18 espèces nordiques migratrices) ont été observées durant les relevés. Le Phalarope à bec étroit (*Phalaropus lobatus*) était l'oiseau de rivage le plus abondant (pics de 21 144 et de 10 077 oiseaux en 2001 et en 2002, respectivement). Le Bécasseau à échasses (*Calidris himantopus*), le Bécasseau semipalmé (*C. pusilla*), le Bécasseau de Baird (*C. bairdii*) et le Bécasseau minuscule (*C. minutilla*) étaient également abondants dans le complexe. Plus de 35 000 et 25 000 oiseaux de rivage ont été observés en mai 2001 et 2002, respectivement, ce qui témoigne de l'importance du complexe de milieux humides du lac Kutawagan pour les limicoles durant la migration printanière. La sécheresse a entraîné dans la région une détérioration des milieux humides et par conséquent une baisse des effectifs d'oiseaux de rivage en 2002. Cependant, vu le nombre de limicoles fréquentant le complexe, la zone est admissible au statut de site régional du Réseau de réserves pour les oiseaux de rivage dans l'hémisphère occidental. La variété des milieux humides quant à leurs types et à leurs tailles, offrant divers habitats propices aux oiseaux de rivage, surtout quand les conditions sont « normales », fait de ce complexe de milieux humides une importante halte migratoire pour les limicoles.

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1.0 Introduction

Shorebirds fly long distances during annual migrations between breeding and wintering areas in North America along three primary routes, the Atlantic and Pacific coasts and the interior mid-continent. Many shorebirds are capable of non-stop flights of several thousand kilometres, fuelled by fat (energy) reserves (Castro and Myers 1989, Gudmundsson et al. 1991, Harrington et al. 1991, McNeil and Cadieux 1972), while others must stop in areas of suitable habitat to rest and feed in order to replenish fat reserves. On the coasts, shorebird migration occurs along a narrow corridor and traditional stopover sites are used. In the interior mid-continent, migration occurs along a much broader front to take advantage of available wetland habitat which can vary significantly from year to year. Large concentrations of migrant shorebirds have been observed using select lakes throughout the continent's interior and these sites have been identified as being critical for shorebird migration (Harrington and Perry 1995, Morrison et al. 1995).

Prairie wetlands are quite ephemeral with wetland availability and condition being variable within and between years depending on precipitation and weather patterns. Shorebirds adapt readily to changing water regimes and are opportunistic in their use of wetland habitat. The prairie region provides numerous and variable wetland habitats (Colwell and Oring 1988, Hands et al. 1991, Rundle and Fredrickson 1981, Skagen and Knopf 1994a, Skagen and Knopf 1994b) suitable for migrant and staging northern nesting shorebirds, as well as prairie breeding shorebirds. Shorebird migration staging in the Canadian prairies was initially documented through aerial surveys (Dickson and Smith 1988). Subsequently, there has been an increased effort to identify key shorebird staging lakes across the prairie landscape and to monitor species numbers at these sites through intensive ground surveys. The Quill Lakes (Alexander and Gratto-Trevor 1997), Last Mountain Lake (Colwell et al. 1988), Chaplin and Old Wives Lakes (Beyersbergen, unpub data) and numerous other Saskatchewan lakes were found to support large concentrations of shorebirds during spring and fall migration.

Early surveys by Smith and Dickson (1989) reported some use of Kutawagan Lake by shorebirds in the spring with reduced use in the fall. Kutawagan Lake is located in the Mount Hope-Prairie Rose Community Pasture in east central Saskatchewan between Quill Lakes, to the northeast, and Last Mountain Lake, to the southwest; both are important shorebird areas (Figure 1). The Important Bird Areas program (http://bsc-eoc.org/iba/IBAsites.html) lists Kutawagan Lake as a Nationally Significant Site because of waterfowl concentrations. Historical records show small concentrations of shorebirds using the site. Wedgewood (1982) noted about 1,000 Least Sandpipers were observed during the spring migration period. The aerial survey project for shorebirds conducted on the Canadian prairies, recorded 5,654 birds on Kutawagan Lake during late May, 1987 (Smith and Dickson 1989). American Avocet (438) and Black-bellied Plover (250) had

Figure 1. Kutawagan Lake wetland complex in the Mount Hope-Prairie Rose (PFRA) Community Pasture, Saskatchewan.

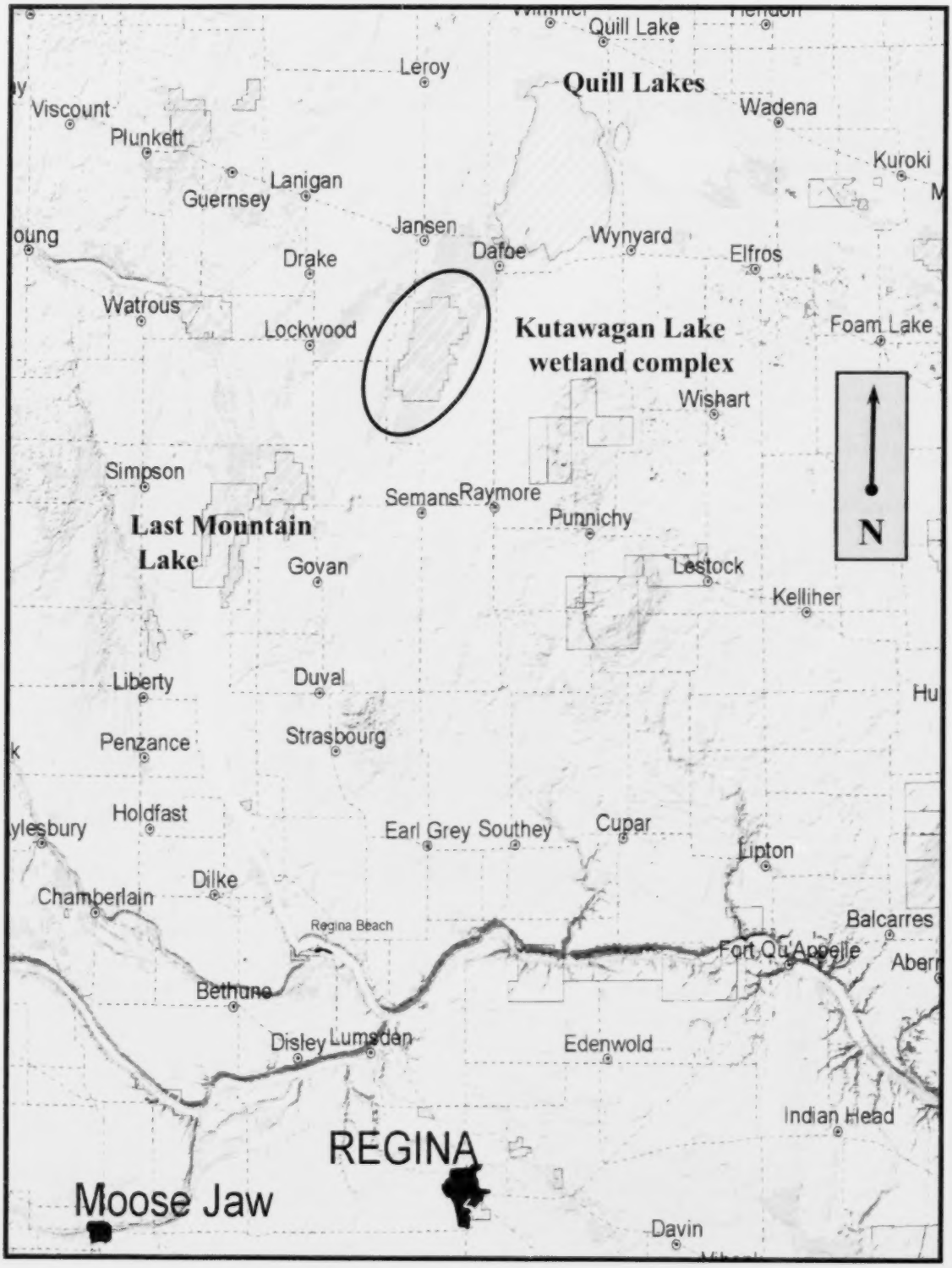

Figure 1. Kutawagan Lake wetland complex in the Mount Hope-Prairie Rose (PFRA) Community Pasture, Saskatchewan.

the highest species counts while the majority of the shorebirds were categorized as unidentified (various size categories). Fall aerial surveys, in the same year, only recorded a count of 1,119 shorebirds in mid August. The area supported an estimated 12,228 shorebirds during an aerial survey conducted in the spring of 1988 (Morrison et al. 1995). Shorebird ground surveys in late May 1989 recorded 8,282 shorebirds on Kutawagan Lake which included 3,825 Red-necked Phalaropes, 1,925 White-rumped Sandpipers and 1,500 Semipalmated Sandpipers (Canadian Wildlife Service unpub data). The five year International Piping Plover surveys are the only other shorebird surveys previously conducted on the Kutawagan Lake wetland complex, where 8 plovers were observed in 1991 (Fleming 1994) and no plovers in 1996 (Skeel et al. 1996).

The focus of this two year study was to investigate the Kutawagan Lake wetland complex and to determine if the complex is an important area used by shorebirds during spring migration.

2.0 Study Area

This two-year (2001 and 2002) spring shorebird migration study was conducted in the Mount Hope-Prairie Rose Community Pasture of the Prairie Farm Rehabilitation Administration (PFRA). Entry to the pasture complex is restricted because of cattle grazing operations during the summer months and access to conduct surveys was granted through acquisition of Right-of-Entry license (File number: 4557:925-7M8-11).

Mount Hope-Prairie Rose Community pasture encompasses 13,221 hectares of upland grazing habitat and wetland basins. For ease of future discussions, the complex of wetlands within the survey area will be defined as the "Kutawagan Lake wetland complex". A detailed airphoto mosaic outlining the complex and survey areas, wetlands and access or viewing points to the wetlands is found in Appendix 1. Within the complex there are several larger saline lakes and a series of smaller saline basins (Figure 1) which have been managed or rehabilitated to some degree by Ducks Unlimited Canada (DUC). Initial water management programs began with Kutawagan Lake (998ha, Figure 2) in 1956, Pel Lake (1282ha, Figure 2) in 1957 and more recent water management projects on some of the smaller wetlands from 1996 to 1998 (C. Deschamps DUC pers. comm.).

3.0 Methods

Surveys were conducted by two biologists using All Terrain Vehicles (ATVs). Travel within the pasture complex was confined to existing trails. The area was divided into survey sections based on distinct wetland basins and lengths of shoreline. Surveys were conducted along the trails when adjacent to the smaller wetlands. If surveys were not possible from the trail, the shoreline was accessed using the most direct route. Surveys on these larger wetlands were conducted by travelling on the ATV along the grass edge of the shoreline around the perimeter of the basin (Appendix 2).

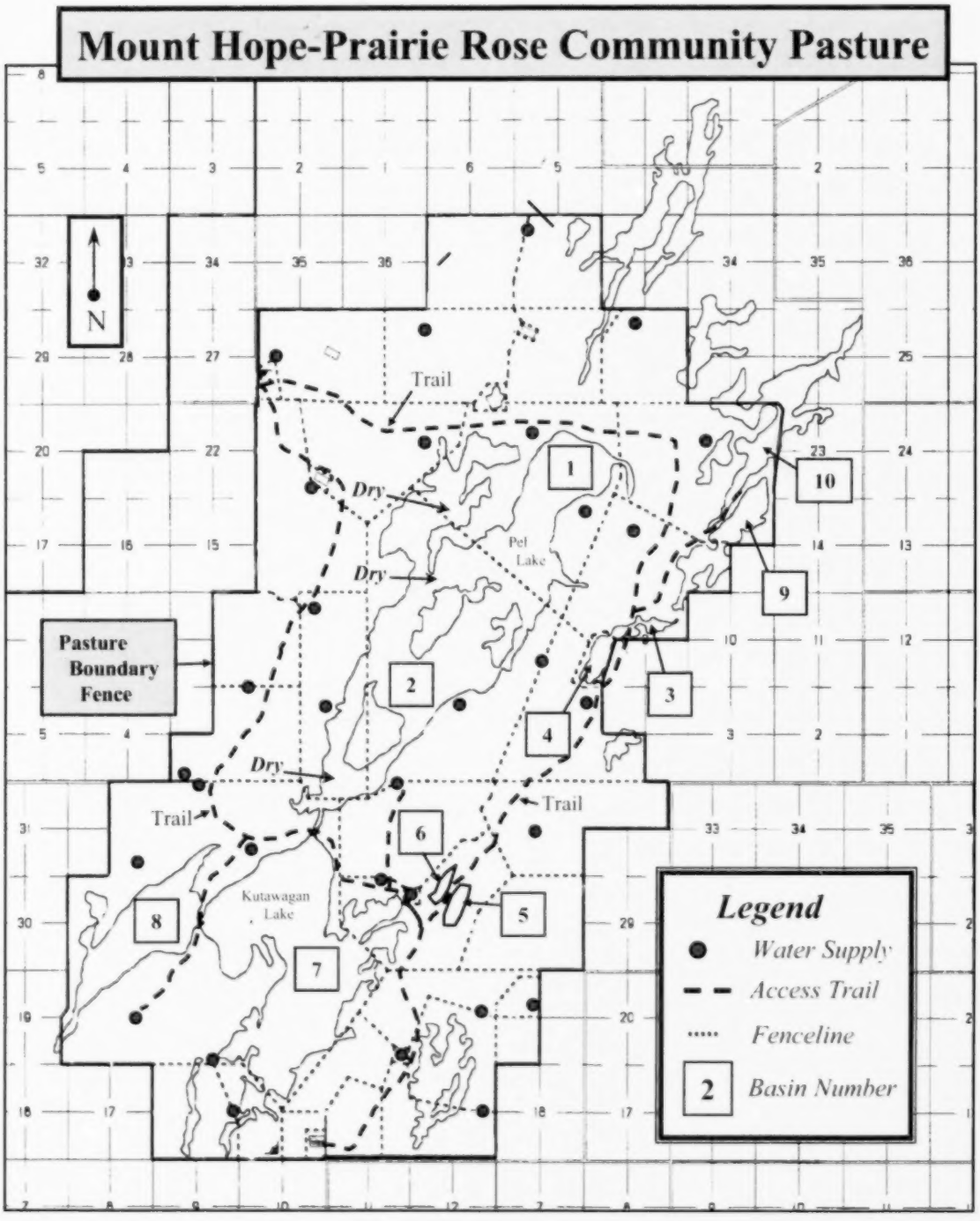

Figure 2. Shorebird survey wetland basin sections for the Mount Hope-Prairie Rose Community Pasture (Kutawagan Lake wetland complex).

Shoreline habitat was subjectively identified based on its suitability for migrant shorebirds. Suitable habitat was characterised as open shoreline which included exposed mudflats (narrow or extensive), short upland vegetation along mudflats or shallow water zones in the near shore areas. Deep water shorelines with dense stands of emergent vegetation were not considered suitable for shorebirds, with the exception that deeper water areas may provide foraging habitat for Red-necked Phalaropes (scientific names - see Appendix 3).

Shorebirds were identified using binoculars and /or a 15-60X spotting scope. The data was recorded using audio-cassette recorders and included the species or size category (Appendix 3), number of birds, and location by survey basin. When birds could not be identified to the species level, due to the similarity of several species of smaller shorebirds, mixing of multiple species of shorebirds in large flocks and distance from the observer, they were categorized as small, medium or large. Long-billed and Short-billed Dowitcher were not differentiated.

Each day, upon completion of the survey, observation data were transcribed onto hard copy field data forms (Appendix 4). These data were then entered into a Microsoft® EXCEL file on a computer database for later analysis.

Surveys on the complex were conducted on four day intervals from 11 - 22 May, 2001 (logistical constraints prevented surveys after May 22) and 15 - 28 May, 2002 for a total of four surveys each year. Spring surveys normally run through the first week of June to capture the peak numbers of the various shorebird species migrating through the area but logistical issues prevented full time-period coverage in 2001 and drought induced factors shortened the survey period in 2002. Weather conditions were favourable and all basins in the complex were surveyed on a regular basis during the spring migration period except for survey section 2 in 2001. The west shore of basin 2 was inaccessible in 2001 because of high water during all periods except for 18 May.

4.0 Results & Discussion

The defining of suitable shorebird habitat within the complex was based on previous experience and observations during shorebird surveys of other lakes and wetland areas of the province. Shorebird preference for these areas could be defined by several factors including a shorebird's early detectability of predators, access to variable types of feeding areas (near shore upland habitat with short or sparse vegetation, mudflats and shallow water), and disturbance free resting habitat.

Shorebird habitat conditions between the two years differed significantly. Narrow bands of exposed mudflats were the norm in 2001 while exposed mudflats varied in width from less than a meter to tens of meters for most of the basins in 2002. In 2001 the majority of survey basin 8 (West Kutawagan), the west and north shores of survey basin 7, and the east and north west shore of survey basins 1 and 2 provided good shorebird habitat. Water levels appeared low in most of these basins which resulted in exposed mudflats areas. Drought conditions across much of central Saskatchewan led to much lower water

levels or even dry basins in spring 2002. Basins 1, 2, 4 and 8 contained good shorebird habitat and supported large numbers of shorebirds in the first three visits of 2002. However, by the fourth survey basins 2, 4 and 8 were dry and only 1/3 of the surface area of basin 1 was covered by water. In both years most of the smaller basins (survey basins 3, 4, 5, 6 and 9) had variable amounts of suitable habitat except for basin 10 which was dry in 2002.

Twenty seven shorebird species, including 9 prairie breeding species and 18 northern migrant species, were observed at the Kutawagan Lake wetland complex during spring surveys in 2001 and 2002 (Table 1). Shorebird migration studies at the Quill Lakes (Alexander and Gratto-Trevor 1997) showed that the majority of the northern nesting shorebirds migrate through the area during the last two weeks of May. In both survey years at the Kutawagan Lake wetland complex, peak shorebird numbers were recorded in the third week of May however peak numbers in 2002 were only 53% of those observed in 2001. Additionally, the peak numbers recorded in 2001 may have been an underestimate because numbers were still increasing up to May 22 when the last survey was conducted. The rapidly drying and deteriorating condition of the shorebird wetland basins in the complex in 2002 likely forced shorebirds to disperse and locate more suitable wetland habitats.

Results from both years indicate that the migration was dominated numerically by Red-necked Phalarope which peaked around May 22-24. More phalaropes were observed in 2001 than 2002 (Table 1). Peak totals of all other species combined were consistent across both years. The next most abundant species were Stilt Sandpiper and Least Sandpiper in 2001, and Semipalmated Sandpiper and Baird's Sandpiper in 2002. In May 2001, there was a Semipalmated Sandpiper observed which had been marked with two coloured flags and the combination of colours indicated that the bird had been banded in Ecuador.

Differential migration occurs among shorebirds with various species reaching peak numbers on the prairies at different times through the spring and fall (Alexander and Gratto-Trevor 1997, Beyersbergen unpub data). The highest single day counts for each species identified were combined to provide a total for the maximum number of shorebirds recorded during the migration survey. In 2001 and 2002, the total maximum birds observed were 35,279 and 25,450, respectively.

Early migrants, such as the Lesser Yellowlegs and Dowitcher species, peaked relatively early in the surveys (Table 1). The migration of the Yellowlegs and Dowitcher species may have been missed in 2002 at the Kutawagan Lake wetland complex as only very low numbers of both species were recorded while surveys at Kimiwan Lake in northern Alberta reported high number of both species on 16 May, 2002 (Beyersbergen unpub data).

A number of species were only observed in small numbers during the survey period (Table 1). Other studies (Alexander and Gratto-Trevor 1997; Colwell 1987; Colwell et al. 1988; Skagen and Knopf 1993; Skagen 1997) suggest that these same species (e.g.

Ruddy Turnstone, Dunlin, and Semipalmated Plover) move through the area in low numbers. The low number of some of the late spring migrants (e.g. Sanderling, White-rumped Sandpiper) may have been a result of the peak being missed with the early stoppage of spring surveys in 2001 and the early deterioration of wetland conditions in 2002.

Table 1: Numbers of individuals of each shorebird species at the Kutawagan Lake wetland complex, Saskatchewan, in the spring of 2001 and 2002. Species peak numbers are in **bold** type.

	2001				2002			
Species	11 May	14 May	18 May	22 May	15 May	19 May	24 May	28 May
Black-bellied Plover	5	9	43	**87**	15	54	507	**994**
American Golden-Plover	15	2	**33**	0	0	0	**150**	123
Piping Plover	0	0	**1**	0	1	1	**2**	2
Semipalmated Plover	0	8	12	**24**	3	**20**	12	10
Killdeer	14	10	**15**	12	1	2	3	**5**
American Avocet	572	726	**976**	821	302	**388**	151	245
Lesser Yellowlegs	**235**	177	57	6	0	**4**	0	0
Willet	169	164	**185**	123	103	120	118	**180**
Spotted Sandpiper	0	2	7	**8**	0	**1**	0	0
Upland Sandpiper	1	**3**	0	0	0	0	0	0
Whimbrel	0	0	**18**	0	0	0	0	0
Hudsonian Godwit	**10**	2	3	0	0	**3**	0	0
Marbled Godwit	132	**150**	133	61	64	**538**	154	183
Ruddy Turnstone	0	4	3	**45**	0	6	**49**	18
Red Knot	0	0	**3**	2	0	0	**16**	9
Sanderling	7	**141**	39	71	179	128	**629**	226
Dunlin	0	9	27	**33**	4	10	**15**	1
Pectoral Sandpiper	0	42	42	17	3	**50**	3	43
White-rumped Sandpiper	0	9	33	**49**	0	0	230	**241**
Baird's Sandpiper	8	**605**	526	405	**2038**	[illegible]21	936	601
Semipalmated Sandpiper	100	836	1757	**2559**	2020	**56**[illegible]7	2270	1298
Least Sandpiper	7	142	525	**1051**	0	7	**45**	8
Stilt Sandpiper	25	802	2044	**5617**	1704	**3749**	1679	339
Common Snipe	**1**	0	1	0	0	0	0	0
Wilson's Phalarope	47	**313**	126	47	**557**	52	8	15
Red-necked Phalarope	82	3578	3136	**21144**	530	3183	**10077**	5524
Dowitcher spp.	198	**1931**	209	13	**12**	2	2	0
Small shorebirds	23	431	215	**544**	**824**	142	245	43
Medium shorebirds	0	0	**50**	0	**22**	0	0	0
Total	1651	10096	10219	**32739**	8382	16068	**17301**	10113

Nine species of prairie breeding shorebirds were observed on the wetland complex (Table 1), but only four were observed in substantial numbers: American Avocet, Marbled Godwit, Willet and Wilson's Phalarope. The numbers of American Avocet and Willet were relatively similar throughout the survey periods and may represent resident birds establishing territories in the wetland complex or adjacent areas. American Avocet

numbers were much lower in 2002, likely in response to drought conditions in the area. Marbled Godwit numbers were similar through all survey periods of 2001 but reached numbers more than triple the previous year's peak on 19 May, 2002 possibly representing migrant birds moving through the area in response to drought conditions further south. Wilson's Phalarope numbers peaked around 14-15 May and subsequently dropped in both years, possibly the result of continued northward migration or dispersal to nesting territories in the surrounding landscape. Low numbers were recorded for the remaining five prairie breeding species: Common Snipe, Killdeer, Spotted Sandpiper, Upland Sandpiper and Piping Plover. A single Piping Plover was observed in 2001 and two birds in 2002 with no evidence of nesting in either year. Upland Sandpipers were also observed while survey staff traveled through upland habitat between basins. The species' preferred feeding habitat is the upland areas (Houston and Bowen 2001) thus our survey efforts along the lakes and wetland shorelines likely missed most of the Upland Sandpipers utilizing the area.

Table 2: Total number and percent in parentheses of daily total shorebirds observed by basin and survey date at Kutawagan Lake wetland complex in the spring of 2001 and 2002. See map (Figure 2) for a key to the locations of the survey basins.

Survey Basin	Date							
	2001				2002			
	11-May	14-May	18-May	22-May	15-May	19-May	24-May	28-May
1	385 * (23.4)	1145 (11.3)	1321 (12.9)	23376 (71.4)	3200 (38.2)	5507 (34.3)	2333 (13.5)	980 (9.69)
2	502 (30.4)	5534 (54.8)	4647 (45.5)	1138 (3.5)	4638 (55.3)	8474 (52.7)	105 (0.61)	12 (0.12)
3/4	153 (9.27)	455 (4.5)	1045 (10.2)	430 (1.3)	33 (0.39)	678 (4.22)	3576 (20.7)	24 (0.24)
5/6	119 (7.2)	316 (3.1)	551 (5.4)	132 (0.4)	-	105 (0.65)	1461 (8.44)	1099 (10.9)
7	345 (20.9)	1003 (9.9)	735 (7.2)	3485 (10.6)	400 (4.8)	832 (5.18)	7997 (46.2)	7066 (69.9)
8	136 (8.2)	1459 (14.5)	1474 (14.4)	1439 (4.4)	90 (1.1)	418 (2.6)	679 (3.92)	0
9	7 (0.4)	22 (0.2)	21 (0.2)	103 (0.3)	21 (0.24)	54 (0.34)	1150 (6.65)	932 (9.22)
10	4 (0.2)	162 (1.6)	425 (4.2)	2636 (8.1)	0	0	0	0
Total	*1651*	*10096*	*10219*	*32739*	*8382*	*16068*	*17301*	*10113*

Select wetlands within the complex appeared to be favored sites for shorebird use and during some of the survey periods accounted for the vast majority of shorebird observations (Table 2, Appendix 5). The two large lakes, which included survey basins 1, 2, 7 and 8 accounted for over 80% of all shorebird observations during each survey in both years except for the third 2002 survey where they accounted for approximately 64%

of the total. However, the highest and most consistent shorebird use occurred on survey basins 1 and 2 when water conditions were good. The large northern lake (sections 1 and 2 combined) held 54% to 94% of total shorebird numbers within the Kutawagan Lake wetland complex. This pattern was only disrupted in late May 2002 when basin 2 dried up and water levels in basin 1 were very low.

The increased use of basin 10 during the last survey of 2001 and basins 5/6 and 9 during the last survey of 2002 may have been the result of strong winds and the presence of suitable shelter on the wetland. The increased use of basin 7 in the last two surveys of 2002 likely was a result of four of the other survey basins having gone dry.

5.0 Conclusions

The results of the 2001 and 2002 shorebird surveys have shown that the Kutawagan Lake wetland complex is important to shorebirds during spring migration. Water levels in 2001 were such that extensive areas of suitable habitat were available for use by migrant shorebirds. Drought conditions in 2002 resulted in several key basins going dry and likely affected peak bird numbers. However, shorebirds continued to use wetlands within the complex by dispersing onto those basins which still had suitable wetland habitat. The substantial numbers of prairie breeding shorebirds observed on the site also indicates the site may be important for local breeders especially during years with good water conditions.

The numbers of birds using this complex, 35,279 and 25,450 in 2001 and 2002, respectively, qualify this wetland complex as a Regional level shorebird site under the Western Hemisphere Shorebird Reserve Network (WHSRN). The designation of the Kutawagan Lake wetland complex as a WHSRN site would acknowledge the conservation efforts of the PFRA (wetland/upland habitat) in the Mount Hope - Prairie Rose Community Pasture and complete a chain of WHSRN sites with those already established in east central Saskatchewan (Last Mountain Lake and the Quill Lakes).

Shorebird numbers observed at the Kutawagan Lake wetland complex (>35,000; spring 2001) are comparable to other important shorebird sites recently surveyed across the prairies such as Luck Lake, Saskatchewan (>40,000; spring 2001; Norton and Beyersbergen, 2002), Beaverhill Lake, Alberta, a Regional WHSRN site (>55,000; spring 1995; Morrison et al., 1995) and Kimiwan Lake, Alberta (>32,000; spring 2002; Beyersbergen, unpub data). Although the Kutawagan complex did not reach the level of use of the Quill Lakes (>100,000; spring 1990; Alexander and Gratto-Trevor 1997) or Chaplin / Old Wives Lakes (>100,000; spring 1993; Morrison et al. 1995) both in Saskatchewan, this wetland complex needs to be recognized as being an important site in providing feeding and resting habitat for migrant as well as local breeding species of shorebirds. This was especially true during the more "normal" year when water conditions were good and wetland diversity in the complex provided a variety of wetland habitat conditions for shorebirds.

Several important factors regarding shorebird use of the complex were not addressed in these surveys. The effect of continued drought on the availability of wetland habitat on the complex needs to be assessed. The shallow basins would remain dry, but would suitable and sufficient habitat be provided through the additional reduction of water levels in the deeper wetlands on the complex? Monitoring during the drought would be required to answer this question. Additionally, fall surveys would define whether the complex is used for pre-migration staging by local breeding adults and locally produced juveniles, as well as migrant shorebirds on their southward journey. Such surveys, although best considered once the area has recovered from the current drought conditions, could be included in monitoring during drought years, as noted above. Future, periodic surveys should therefore be conducted on the complex to monitor wetlands conditions, suitability and availability of shorebird wetland habitat as well as the regularity and extent of use by shorebirds during both migration periods.

Mount Hope-Prairie Rose is an integral part of the PFRA Community Pasture program; this program has been beneficial not only to livestock producers but also to wildlife through the preservation of wildlife habitat (upland and wetland). The protection of marginal soils from erosion and enhancement through maintenance of permanent cover in the uplands provides nesting habitat for a variety of wildlife species including shorebirds. Additionally, the active involvement of partners, such as the PFRA and DUC results in riparian and wetland area management with improved water quality beneficial to domestic livestock and a variety of wildlife species.

The cyclical, drought and flood induced, nature of prairie wetlands will continually influence habitat availability for shorebirds. However the opportunistic nature of shorebirds ensures that when conditions are suitable they will make use of available wetland habitat. The conservation practices for wetlands and uplands of the PFRA will ensure the integrity of the area even during drought years and will provide good habitat during normal 'wet' years. Current water management projects of Ducks Unlimited Canada on the Kutawagan Lake wetland complex should be maintained as they provide good wetland habitat for waterfowl, shorebirds and other waterbirds. When the area receives sufficient precipitation to move out of the current drought cycle, habitat will be favorable for a diverse range of species across the numerous wetland basins in the complex.

6.0 Acknowledgments

Special thanks to Steve Beck, PFRA Land manager based in Watrous, Saskatchewan who provided access to and an introductory tour of the Mount Hope-Prairie Rose community pasture which included an orientation of the trail network, outlined restrictions and delineated important features of the area. His continued support in 2002 was beneficial to successful completion of the project. Trisha Lang assisted with surveys in 2002 and preparation of this report. Charles Deschamps of Ducks Unlimited Canada provided information on wetland projects in the community pasture. Martin Schmoll prepared the GIS map of Saskatchewan. Funding for this project was provided by the Canadian

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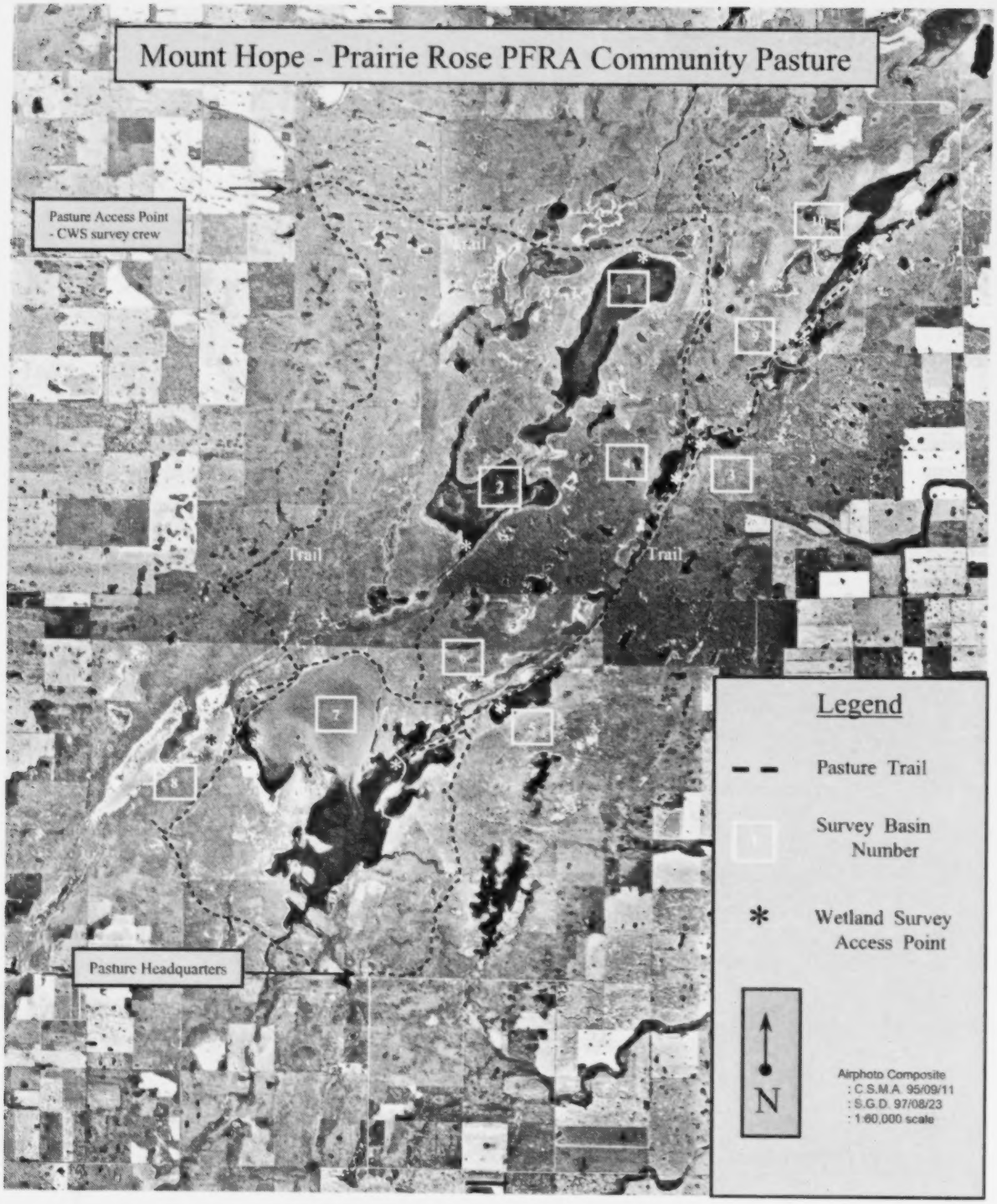
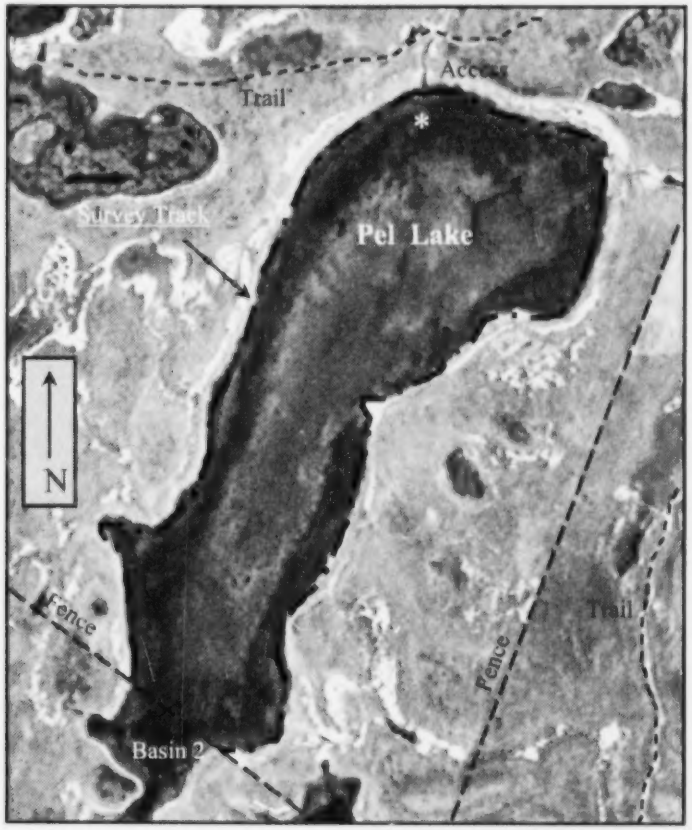
8.0 Appendices

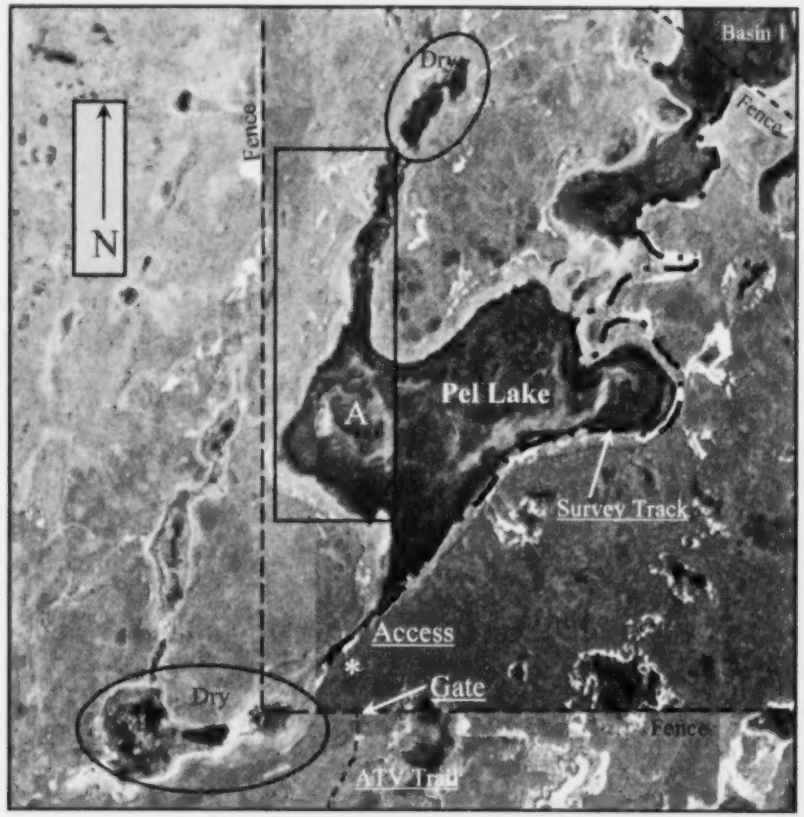


Appendix 1. Airphoto coverage (1995 & 1996) of the pasture and wetland features and the shorebird survey basin identity numbers of the Mount Hope-Prairie Rose [PFRA] Community Pasture.

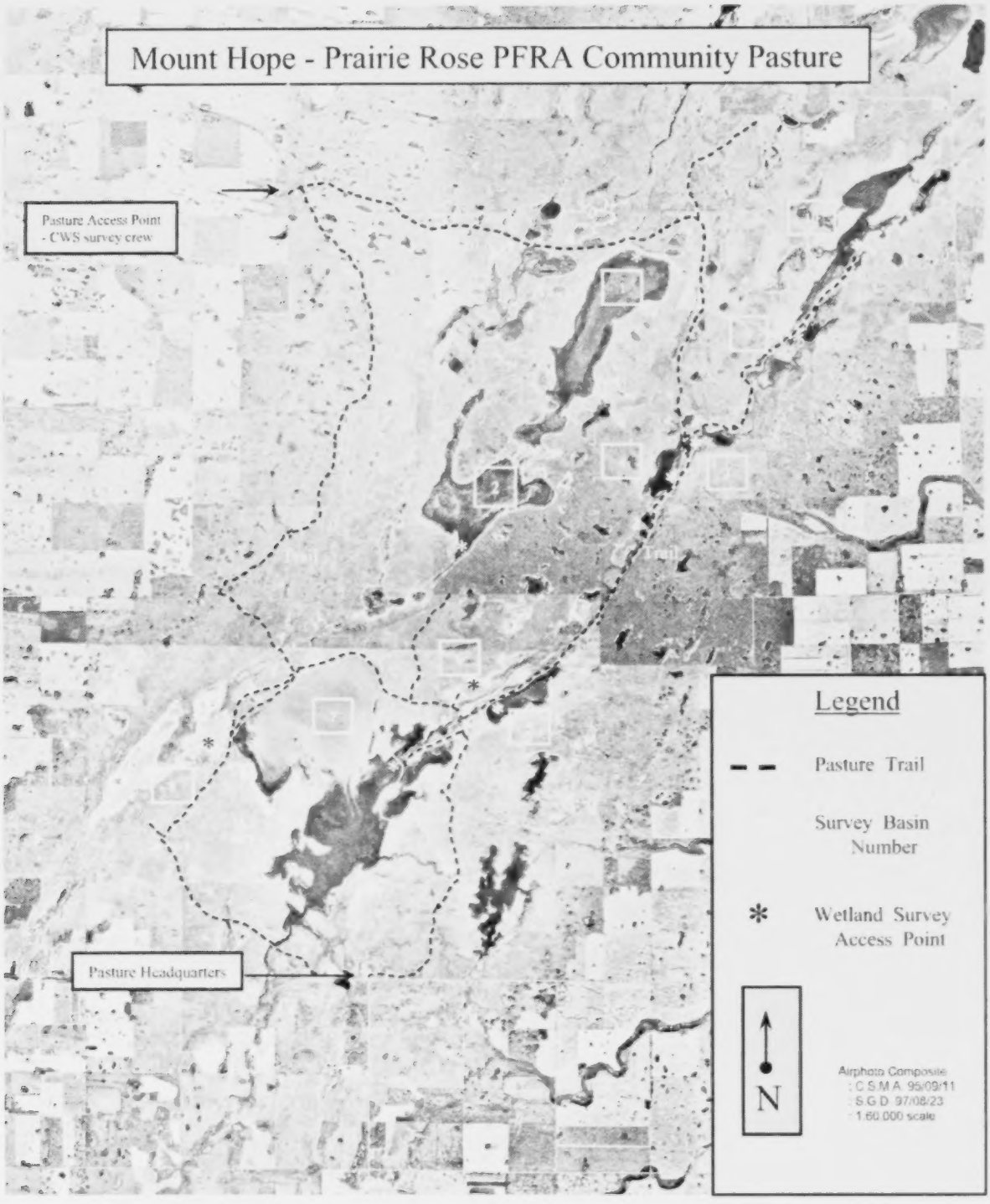
Appendix 2. Detailed airphoto coverage of individually surveyed wetlands with selected features of the wetlands, trails or landscape.



Basin 1: Northern section of Pel Lake and survey follows lake shoreline. Access from trail on north end of lake. Total lake coverage along shoreline by ATV.



Basin 2. Southern section of Pel Lake with access point on south end at the gate. Coverage of area "A" outlined in square was once in 2001 because of inaccessibility due to water and fences but total coverage in 2002. Travel in 2001 was restricted to the east shore with viewing of shorebirds along the west shore with a spotting scope.



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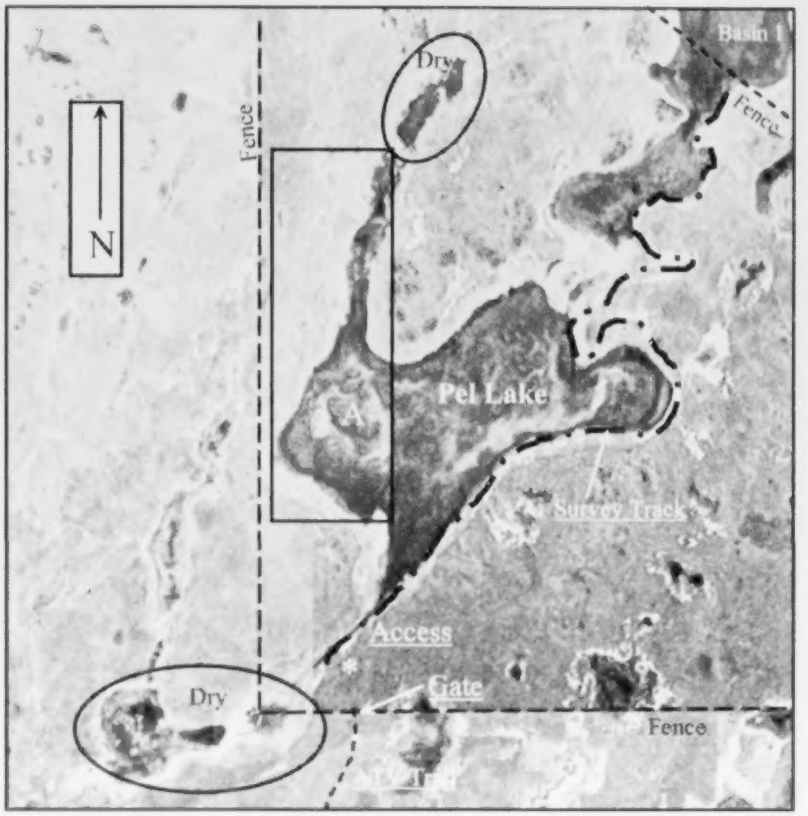

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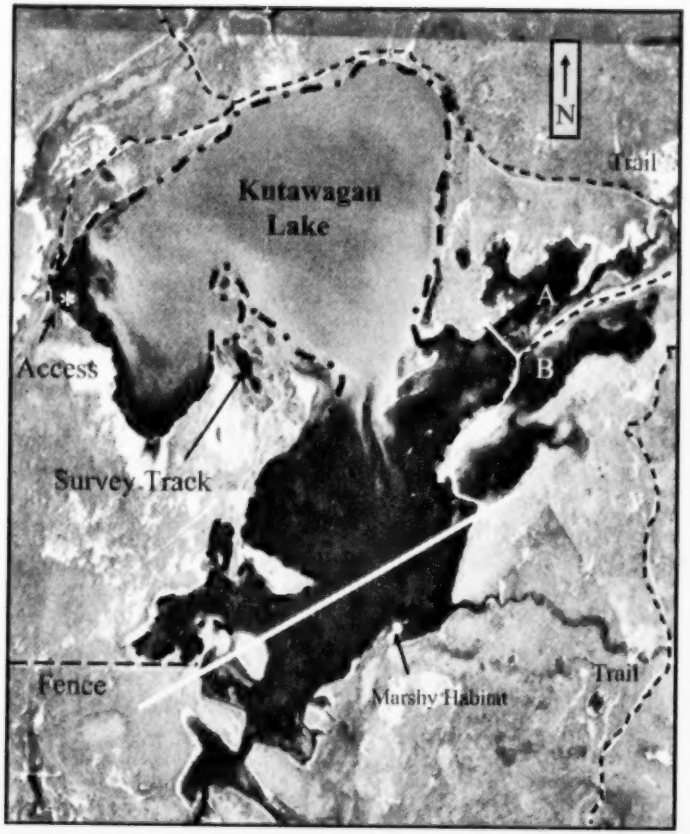
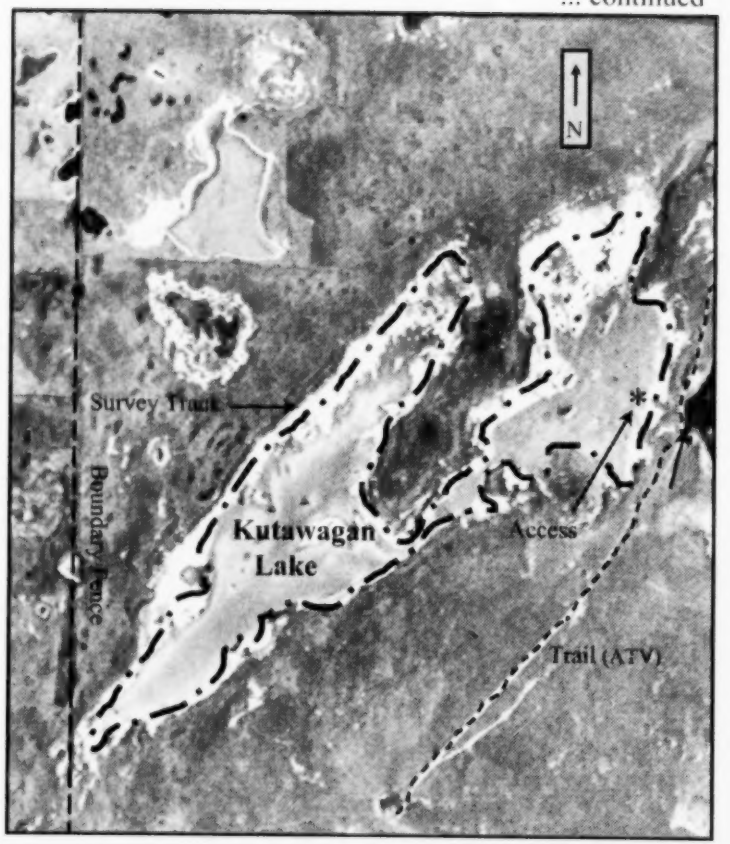
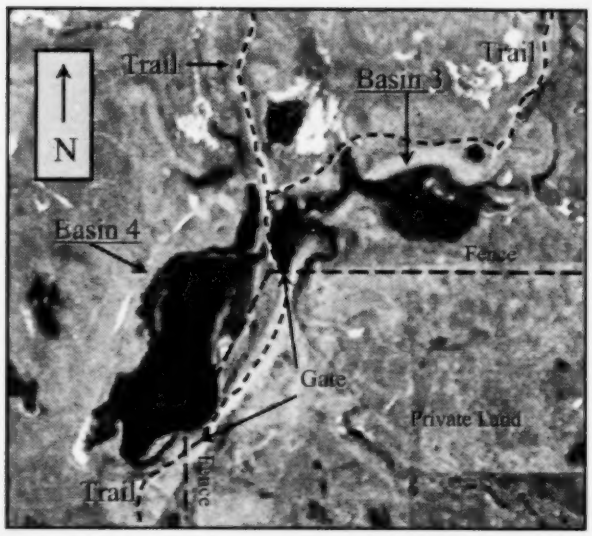


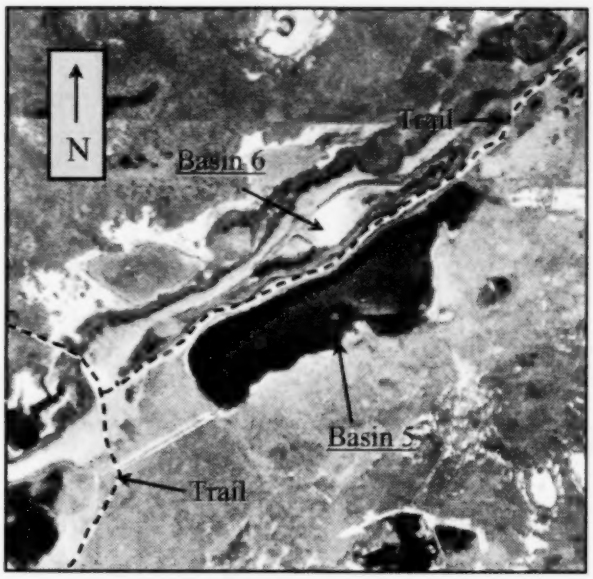
Basin 7 : Eastern section of Kutawagan Lake where survey track follows the shoreline. Shorebird observations on basins A and B were conducted from the trail. Marshy shoreline habitat (separation delineated by solid white bar) was a deep water area with cattail/bulrush and generally unsuitable for shorebirds.



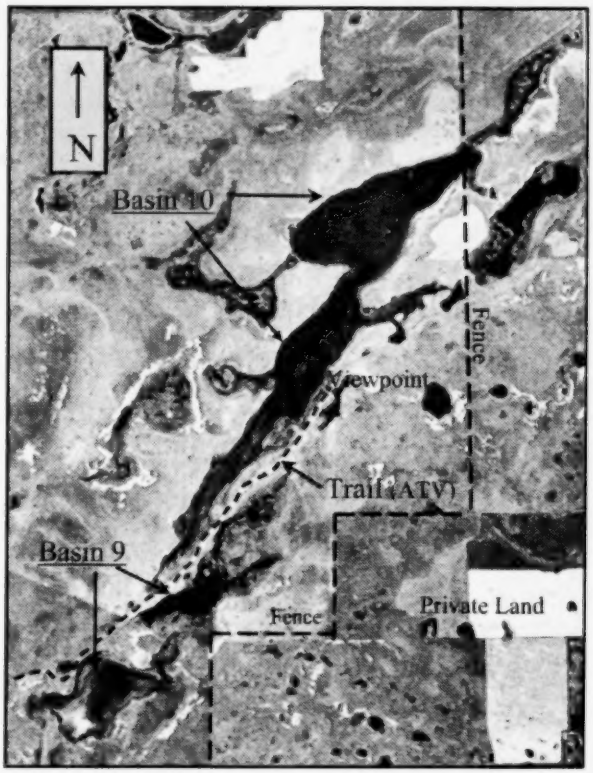
Basin 8 : Western portion of Kutawagan Lake where the survey route followed the complete lakeshore with no fences to restrict travel by ATV. Access to lake was off the trail at the dam site which created the two sections of Kutawagan Lake.

Basins 3 - 4. Both basins are surveyed from the trail. Trail crosses private land between the two gates. Basin 3 marshy habitat with bulrush stands and deeper water. Basin 4 is a shallow water alkaline basin with bulrush around the shoreline.

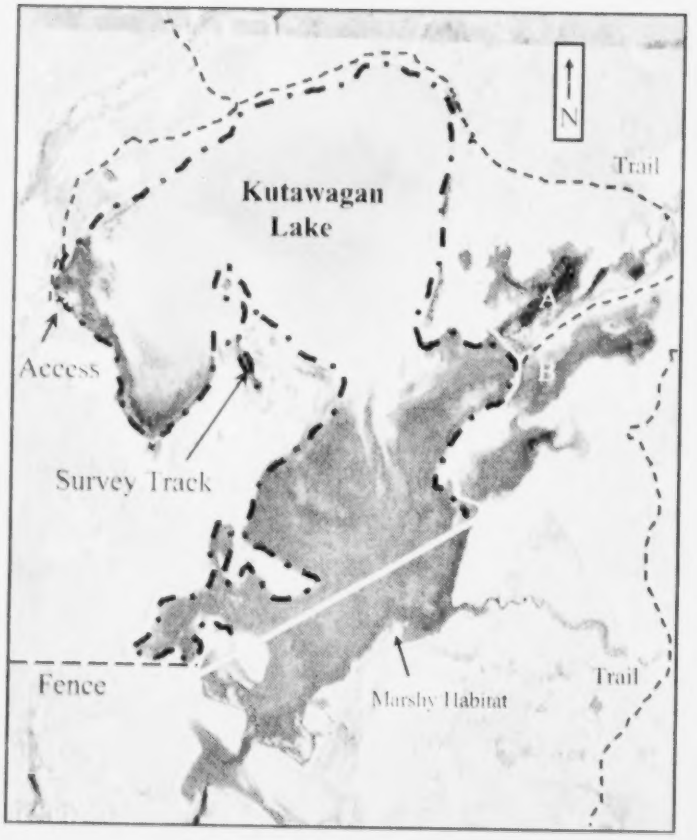




Basins 5 - 6. Both basins are surveyed from the trail using a spotting scope. The trail is elevated which allows for good observation of both wetlands.



Basins 9 - 10. Basin 9 viewed from trail, while basin 10 is checked from trail end at viewpoint using spotting scope.



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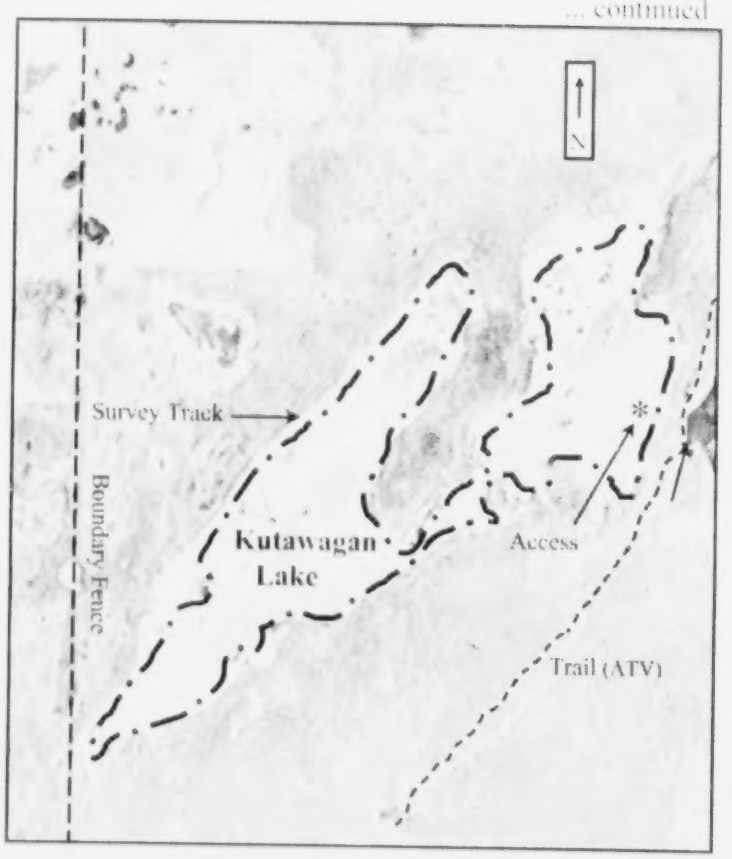

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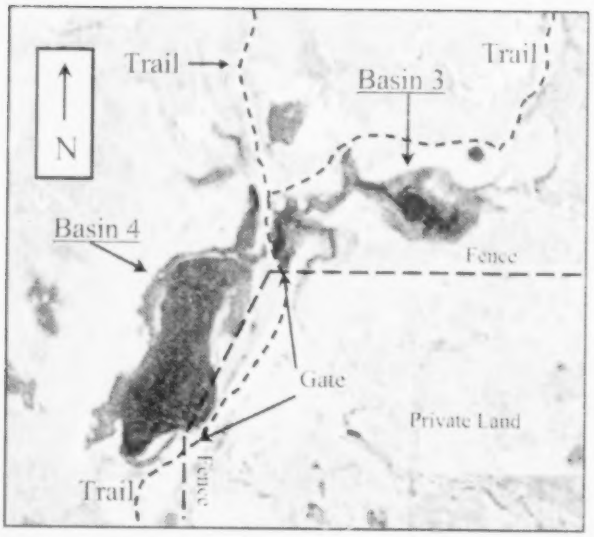

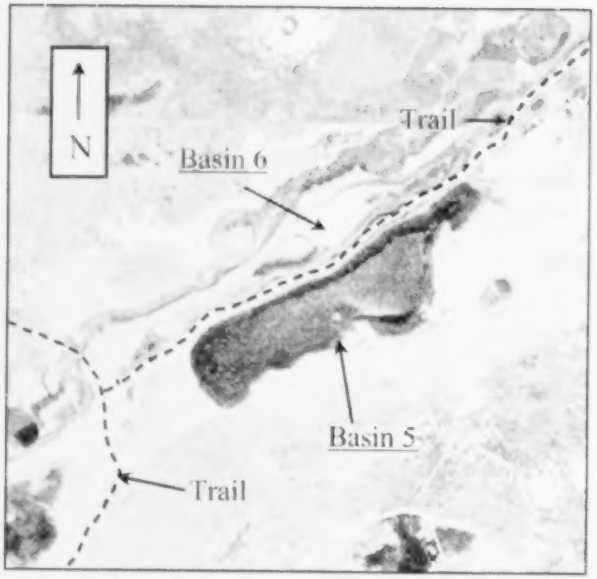

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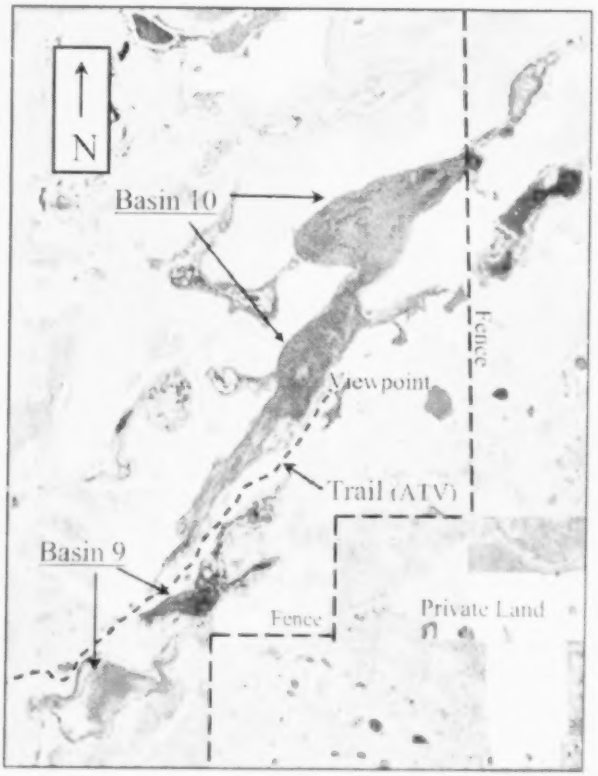

Basins 9 - 10. Basin 9 viewed from trail, while basin 10 is checked from trail end at viewpoint using spotting scope.

Appendix 3. Scientific names, species alpha-codes and size categories for shorebirds observed on the Mount Hope-Prairie Rose Community Pasture wetland complex.

Common Name	Scientific Name	Alpha-code	Size Category
Black-bellied Plover	*Pluvialis squatarola*	BBPL	Medium
American Golden Plover	*Pluvialis dominica*	AGPL	Medium
Semipalmated Plover	*Charadrius semipalmatus*	SEPL	Small
Piping Plover	*Charadrius melodus*	PIPL	Small
Killdeer	*Charadrius vociferus*	KILL	Medium
American Avocet	*Recurvirostra americana*	AMAV	Large
Lesser Yellowlegs	*Tringa flavipes*	LEYE	Medium
Willet	*Catoptrophorus semipalmatus*	WILL	Large
Spotted Sandpiper	*Actitis macularia*	SPSA	Small
Upland Sandpiper	*Bartramia longicauda*	UPSA	Large
Whimbrel	*Numenius phaeopus*	WHIM	Large
Hudsonian Godwit	*Limosa haemastica*	HUGO	Large
Marbled Godwit	*Limosa fedoa*	MAGO	Large
Ruddy Turnstone	*Arenaria interpres*	RUTU	Medium
Red Knot	*Calidris canutus*	REKN	Medium
Sanderling	*Calidris alba*	SAND	Small
Semipalmated Sandpiper	*Calidris pusilla*	SESA	Small
Least Sandpiper	*Calidris minutilla*	LESA	Small
White-rumped Sandpiper	*Calidris fuscicollis*	WRSA	Small
Baird's Sandpiper	*Calidris bairdii*	BASA	Small
Pectoral Sandpiper	*Calidris melanotos*	PESA	Medium
Dunlin	*Calidris alpina*	DUNL	Small
Stilt Sandpiper	*Calidris himantopus*	STSA	Medium
Common Snipe	*Gallinago gallinago*	COSN	Medium
Wilson's Phalarope	*Phalaropus tricolor*	WIPH	Medium
Red-necked Phalarope	*Phalaropus lobatus*	RNPH	Small
Dowitcher spp.		DOWI	Medium
Small Shorebirds		SHSM	Small
Medium Shorebirds		SHME	Medium

Appendix 4. Field data form for audio cassette tape recordings of shorebird observations.

_____. **LAKE SHOREBIRD CENSUS** Page ____ of ____.____.

Observer: _____. Survey Date: ___/___/_____. Wind : _____/_____. Cloud :_____.
m d y dir. speed

SEG. NO.	TIME 2400	SPECIES	NUMBER OF BIRDS		SEG. NO.	TIME 2400	SPECIES	NUMBER OF BIRDS

Appendix 5: Detailed shorebird survey results for Mount Hope - Prairie Rose Community Pasture in spring 2001 and 2002. Numbers of birds observed are given by survey basin and date. See map (Figure 2) for locations of the survey basins.

Species	Survey Section									Total
	1	2	3	4	5/6	7	8	9	10	
Survey Date: May 11, 2001										
Black-bellied Plover	0	0	0	0	0	3	2	0	0	5
American Golden-Plover	3	0	0	0	0	12	0	0	0	15
Killdeer	0	0	0	1	4	7	2	0	0	14
American Avocet	236	157	9	21	22	72	50	2	3	572
Lesser Yellowlegs	28	117	0	14	20	41	15	0	0	235
Willet	41	30	6	8	13	54	16	0	1	169
Upland Sandpiper	0	1	0	0	0	0	0	0	0	1
Hudsonian Godwit	0	2	0	0	0	8	0	0	0	10
Marbled Godwit	37	21	4	1	8	54	6	1	0	132
Sanderling	1	0	0	0	0	6	0	0	0	7
Semipalmated Sandpiper	18	0	0	0	0	71	11	0	0	100
Least Sandpiper	6	0	0	0	0	1	0	0	0	7
Baird's Sandpiper	0	0	0	5	0	2	1	0	0	8
Stilt Sandpiper	0	20	0	1	2	0	2	0	0	25
Common Snipe	0	0	0	0	1	0	0	0	0	1
Wilson's Phalarope	2	0	10	4	14	11	2	4	0	47
Red-necked Phalarope	0	21	15	23	23	0	0	0	0	82
Dowitcher spp.	3	133	0	18	12	3	29	0	0	198
Unidentified small shorebird	10	0	13	0	0	0	0	0	0	23
May 11 Total	*385*	*502*	*57*	*96*	*119*	*345*	*136*	*7*	*4*	*1651*

Appendix 5...

... continued.

Species	Survey Section									Total
	1	2	3	4	5/6	7	8	9	10	
Survey date: May 14, 2001										
Black-bellied Plover	1	0	0	0	0	8	0	0	0	9
American Golden-Plover	0	0	0	1	0	0	1	0	0	2
Semipalmated Plover	0	8	0	0	0	0	0	0	0	8
Killdeer	0	2	1	1	2	2	1	1	0	10
American Avocet	139	115	19	32	52	112	229	2	26	726
Lesser Yellowlegs	18	77	1	0	17	49	8	7	0	177
Willet	36	22	5	4	9	44	42	2	0	164
Spotted Sandpiper	0	0	0	0	0	1	1	0	0	2
Upland Sandpiper	0	0	0	0	0	0	3	0	0	3
Hudsonian Godwit	0	1	0	0	0	1	0	0	0	2
Marbled Godwit	10	26	1	1	9	60	37	0	6	150
Ruddy Turnstone	2	0	0	0	0	2	0	0	0	4
Sanderling	27	46	0	0	0	0	5	0	63	141
Semipalmated Sandpiper	6	425	0	33	0	22	350	0	0	836
Least Sandpiper	0	19	0	0	0	0	123	0	0	142
White-rumped Sandpiper	0	0	0	0	0	0	9	0	0	9
Baird's Sandpiper	208	201	0	2	0	22	172	0	0	605
Pectoral Sandpiper	8	33	0	0	1	0	0	0	0	42
Dunlin	0	9	0	0	0	0	0	0	0	9
Stilt Sandpiper	2	684	0	11	3	20	70	0	12	802
Wilson's Phalarope	30	14	15	19	57	146	1	10	21	313
Red-necked Phalarope	566	2534	60	215	130	65	8	0	0	3578
Dowitcher spp.	86	1008	0	22	36	406	339	0	34	1931
Unidentified small shorebird	6	310	2	10	0	43	60	0	0	431
May 14 Total	*1145*	*5534*	*104*	*351*	*316*	*1003*	*1459*	*22*	*162*	*10096*

Appendix 5...

... continued.

Species	Survey Section									Total
	1	2	3	4	5/6	7	8	9	10	
Survey date: May 18, 2001										
Black-bellied Plover	1	6	0	0	1	14	21	0	0	43
American Golden-Plover	20	12	0	0	0	0	1	0	0	33
Semipalmated Plover	0	7	3	0	0	0	2	0	0	12
Piping Plover	0	0	0	0	0	0	1	0	0	1
Killdeer	2	1	2	1	3	5	1	0	0	15
American Avocet	173	234	46	48	18	195	215	0	47	976
Lesser Yellowlegs	6	14	0	0	7	16	14	0	0	57
Willet	40	38	5	5	10	51	35	1	0	185
Spotted Sandpiper	0	0	0	0	0	4	2	1	0	7
Whimbrel	3	0	0	0	0	15	0	0	0	18
Hudsonian Godwit	0	0	0	2	0	0	1	0	0	3
Marbled Godwit	29	38	9	0	5	38	14	0	0	133
Ruddy Turnstone	0	1	0	0	0	2	0	0	0	3
Red Knot	0	0	0	0	0	3	0	0	0	3
Sanderling	3	9	0	0	0	5	22	0	0	39
Semipalmated Sandpiper	50	1215	9	265	40	35	137	0	6	1757
Least Sandpiper	166	212	0	0	0	4	143	0	0	525
White-rumped Sandpiper	0	32	0	0	0	0	1	0	0	33
Baird's Sandpiper	28	330	0	33	0	15	120	0	0	526
Pectoral Sandpiper	2	33	0	0	3	0	4	0	0	42
Dunlin	0	26	0	0	0	0	1	0	0	27
Stilt Sandpiper	200	1036	30	157	32	87	442	0	60	2044
Common Snipe	0	0	0	0	1	0	0	0	0	1
Wilson's Phalarope	14	10	11	14	26	15	5	19	12	126
Red-necked Phalarope	435	1283	288	117	405	180	128	0	300	3136
Dowitcher spp.	33	7	0	0	0	5	164	0	0	209
Unidentified medium shorebird	50	0	0	0	0	0	0	0	0	50
Unidentified small shorebird	66	103	0	0	0	46	0	0	0	215
May 18 Total	*1321*	*4647*	*403*	*642*	*551*	*735*	*1474*	*21*	*425*	*10219*

Appendix 5...

... continued.

Species	Survey Section									Total
	1	2	3	4	5/6	7	8	9	10	
Survey date: May 22, 2001										
Black-bellied Plover	26	22	0	0	0	23	8	8	0	87
Semipalmated Plover	9	0	1	0	0	10	4	0	0	24
Killdeer	1	3	1	0	0	6	0	1	0	12
American Avocet	168	59	16	50	3	273	216	0	36	821
Lesser Yellowlegs	1	0	0	0	0	1	0	4	0	6
Willet	30	20	5	1	8	36	22	1	0	123
Spotted Sandpiper	0	1	0	0	0	1	6	0	0	8
Marbled Godwit	11	15	2	0	5	19	9	0	0	61
Ruddy Turnstone	7	7	0	0	0	23	8	0	0	45
Red Knot	2	0	0	0	0	0	0	0	0	2
Sanderling	41	9	0	0	0	14	7	0	0	71
Semipalmated Sandpiper	2269	24	17	0	0	30	211	0	8	2559
Least Sandpiper	246	284	0	0	3	58	460	0	0	1051
White-rumped Sandpiper	36	9	0	0	0	0	4	0	0	49
Baird's Sandpiper	184	53	2	0	0	23	141	0	2	405
Pectoral Sandpiper	2	13	2	0	0	0	0	0	0	17
Dunlin	30	0	0	0	0	2	1	0	0	33
Stilt Sandpiper	5394	11	0	0	29	8	174	1	0	5617
Wilson's Phalarope	2	0	4	0	5	2	17	17	0	47
Red-necked Phalarope	14910	278	126	200	44	2863	94	39	2590	21144
Dowitcher spp.	7	0	0	0	0	0	6	0	0	13
Unidentified small shorebird	0	330	0	3	35	93	51	32	0	544
May 22 Total	*23376*	*1138*	*176*	*254*	*132*	*3485*	*1439*	*103*	*2636*	*32739*

Appendix 5…

… continued.

Species	Survey Section								Total
	1	2	3/4	5/6	7	8	9	10	
Survey Date: May 15, 2002									
Black-bellied Plover	0	0	0	0	15	0	0	Dry	15
Semipalmated Plover	0	0	0	0	3	0	0	Dry	3
Piping Plover	0	0	0	0	1	0	0	Dry	1
Killdeer	0	0	0	0	1	0	0	Dry	1
American Avocet	251	0	0	0	46	0	5	Dry	302
Willet	11	8	9	0	58	15	2	Dry	103
Marbled Godwit	17	2	3	0	23	16	3	Dry	64
Sanderling	110	65	0	0	4	0	0	Dry	179
Semipalmated Sandpiper	940	1080	0	0	0	0	0	Dry	2020
Baird's Sandpiper	940	956	0	0	102	36	4	Dry	2038
Pectoral Sandpiper	0	2	0	0	1	0	0	Dry	3
Dunlin	1	2	0	0	1	0	0	Dry	4
Stilt Sandpiper	710	980	0	0	7	0	7	Dry	1704
Wilson's Phalarope	110	413	21	0	13	0	0	Dry	557
Red-necked Phalarope	110	320	0	0	100	0	0	Dry	530
Dowitcher spp.	0	0	0	0	12	0	0	Dry	12
Unidentified medium shorebird	0	10	0	0	2	10	0	Dry	22
Unidentified small shorebird	0	800	0	0	11	13	0	Dry	824
May 15 Total	*3200*	*4638*	*33*	*0*	*400*	*90*	*21*	-	*8382*

Appendix 5... ... continued.

Species	Survey Section								Total
	1	2	3/4	5/6	7	8	9	10	
Survey date: May 19, 2002									
Black-bellied Plover	35	2	3	0	12	2	0	Dry	54
Semipalmated Plover	1	18	0	1	0	0	0	Dry	20
Piping Plover	0	0	0	0	1	0	0	Dry	1
Killdeer	0	0	0	1	0	0	1	Dry	2
American Avocet	360	0	0	5	20	0	3	Dry	388
Lesser Yellowlegs	0	0	0	0	4	0	0	Dry	4
Willet	14	9	3	9	39	41	5	Dry	120
Spotted Sandpiper	0	0	0	0	1	0	0	Dry	1
Hudsonian Godwit	0	0	3	0	0	0	0	Dry	3
Marbled Godwit	80	2	400	11	44	1	0	Dry	538
Ruddy Turnstone	1	0	0	0	5	0	0	Dry	6
Sanderling	5	0	0	0	77	46	0	Dry	128
Semipalmated Sandpiper	2199	3340	9	0	112	20	7	Dry	5687
Least Sandpiper	7	0	0	0	0	0	0	Dry	7
Baird's Sandpiper	489	860	79	16	268	209	0	Dry	1921
Pectoral Sandpiper	0	50	0	0	0	0	0	Dry	50
Dunlin	0	10	0	0	0	0	0	Dry	10
Stilt Sandpiper	1563	1972	75	18	77	44	0	Dry	3749
Wilson's Phalarope	30	0	6	16	0	0	0	Dry	
Red-necked Phalarope	657	2185	100	28	170	5	38	Dry	3183
Dowitcher spp.	0	0	0	0	2	0	0	Dry	2
Unidentified small shorebird	66	26	0	0	0	50	0	Dry	142
May 19 Total	*5507*	*8474*	*678*	*105*	*832*	*418*	*54*	-	*16068*

Appendix 5... ... continued.

Species	Survey Section								Total
	1	2	3/4	5/6	7	8	9	10	
Survey date: May 24, 2002									
Black-bellied Plover	20	0	0	0	422	65	0	Dry	507
American Golden-Plover	28	0	33	0	3	66	0	Dry	150
Semipalmated Plover	0	0	0	0	10	2	0	Dry	12
Piping Plover	0	0	0	0	2	0	0	Dry	2
Killdeer	0	0	2	0	0	0	1	Dry	3
American Avocet	0	0	27	6	87	23	8	Dry	151
Willet	15	11	0	8	58	21	5	Dry	118
Marbled Godwit	64	13	2	5	39	21	10	Dry	154
Ruddy Turnstone	0	0	0	0	0	49	0	Dry	49
Red Knot	0	0	0	0	13	3	0	Dry	16
Sanderling	9	0	115	45	374	86	0	Dry	629
Semipalmated Sandpiper	949	36	10	60	1038	152	25	Dry	2270
Least Sandpiper	4	4	6	0	30	1	0	Dry	45
White-rumped Sandpiper	126	0	0	0	81	23	0	Dry	230
Baird's Sandpiper	102	0	257	74	449	39	15	Dry	936
Pectoral Sandpiper	0	3	0	0	0	0	0	Dry	3
Dunlin	3	0	0	0	12	0	0	Dry	15
Stilt Sandpiper	709	0	339	8	451	76	96	Dry	1679
Wilson's Phalarope	1	0	0	0	4	3	0	Dry	8
Red-necked Phalarope	139	26	2785	1255	4853	49	970	Dry	10077
Dowitcher spp.	0	0	0	0	2	0	0	Dry	2
Unidentified small shorebird	164	12	0	0	49	0	20	Dry	245
May 24 Total	*2333*	*105*	*3576*	*1461*	*7997*	*679*	*1150*	-	*17301*

Appendix 5...

... continued.

Species	Survey Section								Total
	1	2	3/4	5/6	7	8	9	10	
Survey date: May 28, 2002									
Black-bellied Plover	89	0	0	0	905	0	0	Dry	994
American Golden-Plover	21	0	0	0	91	0	11	Dry	123
Semipalmated Plover	0	0	0	0	10	0	0	Dry	10
Piping Plover	0	0	0	0	2	0	0	Dry	2
Killdeer	0	1	0	2	2	0	0	Dry	5
American Avocet	0	0	2	30	203	0	10	Dry	245
Willet	64	1	6	17	88	0	4	Dry	180
Marbled Godwit	59	3	5	15	88	0	13	Dry	183
Ruddy Turnstone	0	0	0	0	18	0	0	Dry	18
Red Knot	0	0	0	0	9	0	0	Dry	9
Sanderling	10	0	0	8	208	0	0	Dry	226
Semipalmated Sandpiper	344	0	0	2	931	0	21	Dry	1298
Least Sandpiper	0	0	0	0	4	0	4	Dry	8
White-rumped Sandpiper	81	0	0	2	158	0	0	Dry	
Baird's Sandpiper	11	0	0	12	538	0	40	Dry	601
Pectoral Sandpiper	10	7	0	9	6	0	11	Dry	43
Dunlin	0	0	0	0	1	0	0	Dry	1
Stilt Sandpiper	2	0	0	0	329	0	8	Dry	339
Wilson's Phalarope	4	0	0	0	11	0	0	Dry	15
Red-necked Phalarope	285	0	11	1002	3446	0	780	Dry	5524
Unidentified small shorebird	0	0	0	0	13	0	30	Dry	43
May 28 Total	*980*	*12*	*24*	*1099*	*7066*	*0*	*932*	-	*10113*

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